

REMARKS

Upon entry of this Amendment, claims 1-5, 8-13, and 15-19 are pending, of which claims 1-4 are withdrawn from consideration. Claims 5, 8-13 and 15-19 are currently presented for examination.

In the Final Office Action¹, the Examiner rejected claims 5-12 under 35 U.S.C. § 103(a) as unpatentable over Ohuchi (U.S. Patent No. 6,762,468) in view of Verret (U.S. Patent No. 6,130,144) and Bar-Gadda (U.S. Patent No. 6,579,805); and rejected claims 13-19 under 35 U.S.C. § 103(a) as unpatentable over the admitted prior art of Fig. 26 (APA) in view of Verret and Bar-Gadda.

In the present Amendment, Applicant has canceled claims 6, 7, and 14, without prejudice or disclaimer of their subject matter; has amended claims 5 and 13 to include the elements of canceled claims 6, 7, and 14; and has amended independent claims 5, 10, 13, and 17 to more appropriately define the present invention. Support for these amendments may be found in the specification at, for example, page 17, lines 3-8, and page 24, lines 12-17, as well as in Fig. 13.

Applicant respectfully traverses the rejection of claims 5 and 8-12 under 35 U.S.C. § 103(a) as unpatentable over Ohuchi in view of Verret and Bar-Gadda. A *prima facie* case of obviousness has not been established.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference

¹ The Office Action contains a number of statements reflecting characterizations of the related art and the claims. Regardless of whether any such statement is identified herein, Applicant declines to automatically subscribe to any statement of characterization in the Office Action.

teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). M.P.E.P. § 2142, 8th Ed., Rev. 4 (October 2005), p. 2100-134.

A *prima facie* case of obviousness has not been established because, among other things, Ohuchi, Verret, and Bar-Gadda, either taken alone or in combination, fail to teach or suggest each and every element recited in claim 5. In particular, the applied references fail to teach or suggest at least the claimed "partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium," as recited in claim 5.

Ohuchi is entirely silent as to the claimed "partial pressure ratio of the oxidant to the reductant." Although Ohuchi teaches selectively oxidizing silicon in polycrystalline silicon-germanium, the Examiner acknowledges that Ohuchi does not teach or suggest that the "oxidation atmosphere contains an oxidant for selectively oxidizing Si and a reductant for reducing Ge." See Final Office Action at pages 2-3. In fact, Ohuchi is silent as to a reductant. Thus, Ohuchi necessarily fails to teach that the "partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium," as recited in claim 5.

Verret also fails to teach the claimed "partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium," as recited in claim 5. Verret

teaches forming a Ge layer 34 underneath a $\text{Si}_x\text{Ge}_{1-x}$ alloy layer 32 by oxidizing the Si in the $\text{Si}_x\text{Ge}_{1-x}$ alloy in a steam oxidation step at approximately 1000°C. See Verret, col. 5, lines 6-16. The Examiner applies Verret to teach that “the selective oxidation of Si in the SiGe layer to form an oxide layer is performed in steam.” See Final Office Action at page 3. However, Verret is also silent as to the claimed reductant, and thus certainly fails to teach the claimed “partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO_2 under equilibrium and smaller than a partial pressure ratio of GeO_2 under equilibrium,” as recited in claim 5.

Regarding the Bar-Gadda reference, the Examiner relies on Bar-Gadda’s teachings to allege that “[e]vidently, H_2 is produced by the reaction and therefore present in the steam oxidation atmosphere. Thus, Bar-Gadda’s reference is a factual evidence showing that the steam oxidation atmosphere taught in the combined process of Ohuchi and Verret contains both oxidant (H_2O) for oxidizing Si and reductant (H_2) for reducing Ge as claimed.” See Final Office Action at pages 3-4. This is not correct.

Bar-Gadda discloses that SiO_2 is produced by the chemical reaction:



According to the reaction, H_2 is **produced** by the reaction. Therefore, H_2 is a **product** in a wet oxidation process for producing SiO_2 , **not a reactant**. A reductant is a reactant which increases in oxidation number in a redox chemical reaction. Contrary to the Examiner’s allegations, the mere fact that the chemical reaction of Bar-Gadda allegedly produces H_2 is not factual evidence that H_2 is a reductant in the process taught in Ohuchi and Verret. Rather, since Bar-Gadda only teaches that H_2 is present

as a result of the oxidation process of silicon, the chemical reaction of Bar-Gadda does not in any way teach or suggest that H_2 is a reactant in the thermal-oxidizing step of claim 5 requiring an oxidant and a reductant.

Moreover, even if H_2 in Bar-Gadda were present in the process of Ohuchi and Verret (which Applicant does not concede), Bar-Gadda is silent as to “partial pressure ratio of an oxidant to a reductant, and thus fails to teach or suggest the claimed “partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of SiO_2 under equilibrium and smaller than a partial pressure ratio of GeO_2 under equilibrium,” as recited in claim 5. Bar-Gadda, therefore, does not overcome the above-noted deficiencies of both Ohuchi and Verret. Accordingly, claim 5 is allowable over the Examiner’s proposed combination of Ohuchi, Verret, and Bar-Gadda, and claims 8 and 9 are also allowable over Ohuchi, Verret, and Bar-Gadda at least due to their dependence from claim 5.

Claim 10, although of different scope, recite features that are similar to those recited in claim 5. Claim 10, therefore, is allowable over the combination of Ohuchi, Verret, and Bar-Gadda, at least for the reasons discussed above in regard to claim 5, and claims 11 and 12 are also allowable over the cited references at least due to their dependence from claim 10.

Applicant respectfully traverses the rejection of claims 13 and 15-19 under 35 U.S.C. § 103(a) as unpatentable over the admitted prior art in view of Verret and Bar-Gadda. Applicant’s admitted prior art does not teach or suggest the claimed partial pressure ratio of the oxidant to the reductant, and thus fails to teach or suggest “partial pressure ratio of the oxidant to the reductant is larger than a partial pressure ratio of

SiO₂ under equilibrium and smaller than a partial pressure ratio of GeO₂ under equilibrium," as recited in claim 13. Verret and Bar-Gadda fail to overcome the shortcomings of the admitted prior art, because neither Verret nor Bar-Gadda teaches or suggests at least this limitation, as discussed above in regard to claim 5.

Therefore, Applicant's admitted prior art, Verret, and Bar-Gadda, either taken alone or in combination, do not establish a *prima facie* case of obviousness with respect to claim 13. Accordingly, claim 13 is allowable over the Examiner's proposed combination of Applicant's admitted prior art, Verret, and Bar-Gadda, and claims 15-19 are also allowable over the applied references at least due to their dependence from claim 13.


In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration of this application and withdrawal of the rejection. Pending claims 5, 8-13 and 15-19 are in condition for allowance, and Applicants request a favorable action.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully submitted,

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